IN THE CLAIMS

1. (currently amended) An x-ray refractive element ~~suitable for refracting x rays, comprising:~~ formed of a body of low-Z material having a first end adapted to receive x-rays emitted from an x-ray source and a second end from which the x-rays received at the first end emerge, said x-ray refractive element ~~having columns~~ comprising:

a first row of ~~stacked~~ substantially identical prisms disposed between said first end and said second end along a first direction, and

a second row of substantially identical prisms disposed between said first and second ends along the first direction, each of said prisms of said first row and each of said prisms of said second row being of a substantially triangular shape having two side portions and one base portion,

said first row of substantially identical prisms being arranged on top of said second row of substantially identical prisms in a second direction perpendicular to the first direction such that a base portion of a given prism in said first row faces an intersection point of said side portions of a given prism in said second row.

2. (currently amended) The x-ray refractive element of claim 1, wherein said prisms of said first and second rows are produced by removal of material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of 2π.

3. (currently amended) The x-ray refractive element of claim 1, wherein an intensity transmission of the x-ray refractive element is:

$$T(y) = \exp\left(-X(y)/l\right) = \exp\left(-k|y|l\right),$$

where X(y) is the total path length for a ray through the element, l is an attenuation length, k is constant and y is the distance to the optical axis.

4. (currently amended) The x-ray refractive element of claim 1, wherein an effective aperture is defined by:

$$D = \frac{8\delta^2 lF}{\lambda \tan\theta},$$

where F is the focal length, δ is the decrement of a real part of an index of refraction, l is an attenuation length and Θ is the side angle of the prisms.

5. (currently amended) The x-ray refractive element of claim 1, wherein an aperture increase factor (AIF) is defined by:

$$\mathrm{AIF} = 3.2 \cdot \frac{\sigma_{\mathrm{abs}}}{L_{2\pi} \tan\theta},$$

where σ_{abs} is root-mean-square width of a Multi-Prism Lens (MPL) aperture, $L_{2\pi}$ is 2π-shift length, and Θ is the side angle of the prisms.

6. (currently amended) The x-ray refractive element of claim 1, wherein said x-ray refractive element is made of one or more of silicon and diamond.

7. (currently amended) The x-ray refractive element of claim 1, wherein a focal length is controlled according to a deviation length (y_g) of one end of the element with respect to the incident ray.

8. (currently amended) An x-ray lens ~~suitable for x rays, comprising:~~ formed of a body ~~with~~ of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end are refracted, wherein said x-ray lens ~~having~~ is comprised of two portions, each of said portions ~~including columns~~ comprising:

a first row of ~~stacked~~ substantially identical prisms~~,~~ ~~said portions being arranged at an angle~~

~~relative to each other~~ disposed between said first end and said second end along a first direction, and

a second row of substantially identical prisms disposed between said first and second ends along the first direction, each of said prisms of said first row and each of said prisms of said second row being of a substantially triangular shape having two side portions and one base portion,

said first row of substantially identical prisms being arranged on top of said second row of substantially identical prisms in a second direction perpendicular to the first direction such that a base portion of a given prism in said first row faces an intersection point of said side portions of a given prism in said second row.

9. (currently amended) The x-ray lens of claim 8, wherein said prisms of said first and second rows are produced by removing material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of 2π.

10. (currently amended) The x-ray lens of claim 8, wherein said ~~columns~~ first and second rows are displaced relative to each other.

11. (currently amended) The x-ray lens of claim 10, wherein said ~~columns~~ first and second rows are rotated relative to each other.

12. (currently amended) The x-ray lens of claim 10, wherein said ~~columns~~ first and second rows are arranged in series.

13. (currently amended) An x-ray apparatus, comprising:

at least one x-ray source;

a detector assembly; and

an x-ray refractive element~~,~~ comprising~~:~~ a body of low-Z material having a first end adapted to receive x-rays

emitted from an x-ray source and a second end from which the x-rays received at the first end emerge, said x-ray refractive element ~~having columns~~ comprising:

a first row of ~~stacked~~ substantially identical prisms disposed between said first end and said second end along a first direction, and

a second row of substantially identical prisms disposed between said first and second ends along the first direction, each of said prisms of said first row and each of said prisms of said second row of being of a substantially triangular shape having two side portions and one base portion,

said first row of substantially identical prisms being arranged on top of said second row of substantially identical prisms in a second direction perpendicular to the first direction such that a base portion of a given prism in said first row faces an intersection point of said side portions of a given prism in said second row.

14. (currently amended) An x-ray apparatus, comprising:

at least one x-ray source;

a detector assembly; and

an x-ray lens~~,~~ ~~comprising:~~ formed of a body formed of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end are refracted, wherein said x-ray lens ~~having~~ is comprised of two portions, each of said portions ~~including columns~~ comprising:

a first row of ~~stacked,~~ substantially identical prisms, ~~said portions being arranged at an angle relative to each other~~ disposed between said first end and said second end along a first direction, and

<u>a second row of substantially identical prisms disposed between said first and second ends along the first direction, each of said prisms of said first row and each of said prisms of said second row being of a substantially triangular shape having two side portions and one base portion,</u>

<u>said first row of substantially identical prisms being arranged on top of said second row of substantially identical prisms in a second direction perpendicular to the first direction such that a base portion of a given prism in said first row faces an intersection point of said side portions of a given prism in said second row</u>.

15. (previously presented) A method for fabricating an element that includes a body of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end emerge and that has columns of stacked, substantially identical prisms, said method comprising:

providing an element having prism-patterns; and

removing parts of said element to provide prisms to be assembled to said element.

16. (previously presented) The method of claim 15, wherein said prism patterns are provided using lithographic patterning prior to said removing step.

17. (previously presented) The method of claim 15, wherein said said removing step is achieved by deep-etching into silicon.

18. (previously presented) The method of claim 15, further comprising:

using said element as a mold for chemical vapor deposition of diamond.

19. (previously presented) A method for reducing absorption in multi-prism lens, said method comprising:

removing material in a manner that results in a phase-shift of a multiple of 2π.

20. (currently amended) The x-ray apparatus of claim 13, wherein said prisms <u>of said first and second rows</u> are produced by removal of material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of 2π.

21. (previously presented) The x-ray apparatus of claim 13, wherein an intensity transmission of the element is:

$$T(y) = \exp\left(-X(y)/l\right) = \exp\left(-k|y|l\right),$$

where X(y) is the total path length for a ray through the element, l is an attenuation length, k is constant and y is the distance to the optical axis.

22. (previously presented) The x-ray apparatus of claim 13, wherein an effective aperture is defined by:

$$D = \frac{8\delta^2 lF}{\lambda \tan\theta} \quad ,$$

where F is the focal length, δ is the decrement of a real part of an index of refraction, l is an attenuation length and Θ is the side angle of the prisms.

23. (previously presented) The x-ray apparatus of claim 13, wherein an aperture increase factor (AIF) is defined by:

$$\mathrm{AIF} = 3.2 \cdot \frac{\sigma_{\mathrm{abs}}}{L_{2\pi} \tan\theta},$$

where σ_{abs} is root-mean-square width of Multi-Prism Lens (MPL) aperture, $L_{2\pi}$ is 2π-shift length, and Θ is the side angle of the prisms.

24. (currently amended) The x-ray apparatus of claim 13, wherein said <u>x-ray refractive</u> element is made of one or more of silicon and diamond.

25. (previously presented) The x-ray apparatus of claim 13, wherein a focal length is controlled according to a deviation length (y_g) of one end of the element with respect to the incident ray.

26. (currently amended) The x-ray apparatus of claim 14, wherein said prisms of said first and second rows are produced by removing material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of 2π.

27. (currently amended) The x-ray apparatus of claim 14, wherein said ~~columns~~ first and second rows are displaced relative to each other.

28. (currently amended) The x-ray apparatus of claim 27, wherein said ~~columns~~ first and second rows are rotated relative to each other.

29. (currently amended) The x-ray apparatus of claim 27, wherein said ~~columns~~ first and second rows are arranged in series.